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Panel studies on bank risks and crises

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Chapter 1

Introduction

Fear. Breakdown in confidence. Market capitulation. Financial turmoil. These words are different, not just in degree but also in kind. They are more normative, but no less consequential to the real economy. They are indicative of panic conditions. In panics, once firmly held truths are no longer relied upon. Articles of faith are upended. And the very foundations of economies and markets are called into question. Some economists, market participants, and historians--not so long ago--were prepared to relegate these highly charged descriptions of despair to the dustbin of history. Government policies improved, understanding of economics deepened, and markets found a more sustainable equilibrium, or so it was thought.

(Kevin Warsh[1])

1.1 Background and Motivation

The current financial crisis caught most policy makers and researchers by surprise. Research on early-warning signals of financial crises did not foresee the arrival of such a catastrophic financial crisis. Those researchers and policy-makers who noticed a bubble (see, e.g., Case and Shiller, 2003, and Wheaton and Nechayev, 2007) did not expect this severe a crisis. The International Monetary Fund (IMF, 2009) projects that total credit write-downs because of the current crisis will amount to about 4.1 trillion US dollars, of

[1] Kevin Warsh, *The Panic of 2008, FRB Governor's Speech delivered a*t the Council of Institutional Investors 2009 Spring Meeting, Washington, D.C.

which 1 trillion dollars have already realized. Banks will likely bear two-thirds of these 4.1 trillion US dollars. The huge magnitude of theses losses has serious implications for banking and financial sector stability and for market confidence in financial institutions. The crisis once more illustrates the importance of bank risk management, up-to-date supervisory responses to dynamic requirements of the financial systems, and proper appraisal of risks faced by banks and financial systems.

This thesis focuses upon the risks faced by the banks at the firm and the systemic level. The appraisal of such risks is key to the proper risk management of banks and to maintaining financial stability. Before discussing the risks and their impact on bank performance, it is important to discuss what we mean by financial stability. Defining financial sector stability can be an illusive goal because of the variety and the dynamic nature of threats and risks faced by a financial system. However, its importance cannot be underestimated. In most cases, it appears easier to define the absence of financial sector stability, instead of the existence of financial instability. For example, Crockett (1997: p3) says:

"…define financial stability as an absence of instability… a situation in which economic performance is potentially impaired by fluctuations in the price of financial assets or by an inability of financial institutions to meet their contractual obligations."

Schinasi (2004: p8) presents a survey of the definitions of financial stability and defines financial stability as follows:

"*A financial system is in a range of stability whenever it is capable of facilitating (rather than impeding) the performance of an economy, and of dissipating financial imbalances that arise endogenously or as a result of significant adverse and unanticipated events.*"

Financial stability does not refer only to the absence of a financial crisis but also to situations where a financial system may not be in a crisis but is still fragile. To further investigate what constitutes financial stability, it is useful to have a look at the IMF's core set of Financial Soundness Indicators (FSI) which lists (i) capital adequacy, (ii) asset quality, (iii) earnings and profitability, (iv) liquidity, and (v) sensitivity to market risk as indicators of financial soundness.

There are several factors that affect financial stability, including both systemic and non-systemic (i.e., bank-specific) factors. Eichengreen (2006) divides the causes of financial instability into four categories: (i) unsustainable macroeconomic policies, (ii) fragile financial systems, (iii) institutional weaknesses, and (iv) flaws in the structure of international financial markets.

Wrongly timed and *unsustainable macroeconomic policies* can take various forms. For example, imprudent regulation in financial markets and/or sub-optimal competitive forces can increase the vulnerability of a financial system. For example, Allen and Gale (2007: p2) refer to the post Great Depression developments and argue that extensive regulation resulted in the virtual disappearance of banking crises in the United States between 1945-1971, but led to many other problems:

"However, the elimination of crises came at a cost. Because of the extensive regulation and government intervention the financial system ceased to perform its basic function of allocating investment. There were many inefficiencies as a result. This led to calls for deregulation and the return of market forces to the allocation of investment".

An important question that arises is how financial liberalization and other macroeconomic variables affect the likelihood of systemic and non-systemic crises and what role does supervisory control play in this relationship. We address this question in the chapter 2 of our thesis.

Fragile financial systems may also lead to instability in banks and financial institutions. This fragility may be a consequence of a financial crisis, resulting in lower market confidence, or the industrial organization of the banking industry. The recent focus on bank size as a potential risk factor (see, e.g., Tarullo, 2009) is a consequence of the current financial crisis. While both large and small banks showed heightened balance sheet vulnerability, large banks are being criticized more because of the implied systemic risks. Two questions that emerge from the current situation are: (i) do bank size or market power impact the ability of banks to withstand a crisis, and (ii) how do bank growth and profitability depend on bank size? Both of these questions are important from the perspective of the industrial organization of banking firms and reflect what can be labeled as the built-in risk factors of the financial systems. In this thesis, we examine both questions and check how the impact of financial crisis on earnings volatility depends on the industrial organization of the banking industry.

Institutional weaknesses can refer to both weaknesses in the banking firms' internal governance structure and in supervisory and legal control mechanisms. Weaknesses in the internal governance structure of a bank refer to the inability or unwillingness of bank owners to control the risks of a banking firm. According to Berle and Means (1933), dispersed ownership reduces the effective power of shareholders to control the management of the firm. Moreover, Gomes and Novaes (1999, 2005) argue that large shareholders can have interests that are different from those of minority shareholders. In addition, the bargaining problems due to the presence of multiple controlling shareholders may prevent efficient decision-making. As we show in this thesis, the examination of bank ownership is a necessary constituent of the analysis of bank risk. La Porta *et al.* (1998) argue that small, diversified shareholders are unlikely to be important in countries with weak shareholder protection rights. Therefore, we take shareholder protection rules into account in our empirical model for bank riskiness and also examine how the role of shareholders varies with variation in shareholder protection rights. Moreover, in examining the impact of ownership concentration on bank riskiness, the inter-relationships between the supervisory control effectiveness and ownership concentration have to be taken into account. Demsetz and Lehen (1985) show that in highly regulated industries like the financial sector, ownership monitoring is not an objective pursued by shareholders because it is taken for granted that supervisory agencies take care of this. However, as the level and effectiveness of banking supervision varies significantly from one country to another, ownership monitoring may play an important role in financial industries as well. We show that absence of monitoring from both shareholders and supervisory authority can be detrimental for bank soundness.

Finally, *flaws in the structure of international financial markets* can also lead to financial instability. These flaws can channel into financial instability through currency or debt crises or sub-optimal liberalization of interest rate and capital controls. For example, Devenow and Welch (1996) point out the herding behavior and capital liberalization reversals as the cause of crises, irrespective of other reasons. Moreover, international financial markets inefficiencies can also give rise to currency and sovereign debt crises. We show in this thesis that currency and sovereign debt crises lead to volatility of bank earnings, which reduces financial soundness. In addition, we examine the role of capital liberalization in the propagation of systemic and non-systemic crises.

It is important to mention here that systemic and bank-specific risks turn out to be highly related. Therefore, another focus in this thesis is the variation of non-systemic risks with overall financial system characteristics. To elaborate on this point, when we examine the effect of ownership structure of banking firms, it is important to examine the supervisory control environment and shareholders protection in the financial system. Arguably, there can be differences in the impact of ownership monitoring at different levels of supervisory control and shareholder protection rights. Similarly, when we examine the impact of financial crises on banking firms, a uniform impact cannot be expected, a priori.

1.2 Outline and the Main Findings

In this thesis, we focus on certain systemic and bank-specific factors that play a crucial role in bank performance and risk management. The overall research question examined in this thesis is: *How do various bank-specific and systemic factors affect the riskiness of banks at firm and systemic level?* To examine this question in detail, we specifically examine the following four research questions:

(a) How does financial reform affect the likelihood of the occurrence of systemic and non-systemic banking crises, conditional on the supervisory environment and level of liberalization?

(b) How do financial crises affect the earnings volatility of banking firms, conditional on bank size and market concentration?

(c) How do bank growth and profitability depend on bank size and how persistent are bank growth and profitability?

(d) How does ownership concentration affect bank riskiness conditional on supervisory control and shareholder protection rights?

The structure of the rest of the thesis is as follows: The second chapter focuses on the causes of systemic and non-systemic banking crises. We specifically examine the role played by financial liberalization on the likelihood that systemic and non-systemic crises occur. Our indicators of systemic and non-systemic banking crises are based on the Honohan and Laeven (2005) dataset, whereas the data on financial liberalization has been taken from Abiad *et al.* (2008). Abiad *et al.* (2008) distinguish between seven different kinds of financial reforms that relate to the presence of (i) credit controls and reserve requirements, (ii) interest rate controls, (iii) entry barriers, (iv) state ownership in the banking sector, (v) capital account restrictions, (vi) prudential regulation and supervision of the banking sector, and (vii) securities market policy. Using these new financial liberalization measures for a large sample of developing and developed countries for the period 1973 to 2002, our multivariate probit modeling results suggest that conditional on adequate banking supervision, certain dimensions of financial liberalization reduce the likelihood of systemic crises. In contrast, there is some evidence that the likelihood of non-systemic crisis increases after financial liberalization. In various sensitivity tests, these results turn out to be very robust.

The third chapter focuses on the impact of financial crises on bank earnings volatility, conditional on bank size and market concentration. Our findings suggest that large banks face lower earnings volatility in the wake of financial crises compared to small banks. Moreover, banks operating in more concentrated banking industries face higher earnings volatility. These findings are in line with the results of Stever (2007), who shows that large banks have a better ability to diversify their risks, and De Nicolo *et al.* (2004), who show that more concentrated banking industries are prone to more banking fragility. Our findings are robust to the use of absolute or relative bank size, causes of financial crises, types of banks, and earning volatility definitions.

In the fourth chapter, we investigate the dynamics that influence the organization of the banking industry through growth and profitability. As we know, the structure and organization of the banking industry influence the risks and profitability of individual banks in a significant way. So in this chapter, we particularly focus on (i) whether bank growth and profitability are persistent, (ii) whether bank growth and profitability depend on bank-size, and (iii) the inter-linkages between growth and profitability of a bank. To analyze these questions we use the Generalized Method of Moments dynamic panel analysis for a mixed sample of more than 1500 banks from 65 countries. Our results suggest no evidence of persistence in bank growth but we find significant persistence in bank profitability. Moreover, our results show that the growth and profitability dynamics of banks located in OECD and non-OECD countries differ.

In the fifth chapter, we focus upon the link between bank governance and riskiness and examine the impact of bank ownership concentration on two indicators of bank riskiness, namely banks' non-performing loans and capital adequacy. Using balance sheet information for around 500 commercial banks from more than 50 countries averaged over 2005-2007, we find that concentrated ownership (proxied by different levels of shareholding) significantly reduces a bank's non-performing loans ratio, conditional on supervisory control and shareholders protection rights. Furthermore, ownership concentration affects the capital adequacy ratio positively conditional on shareholder protection. At low levels of shareholder protection rights and supervisory control, ownership concentration reduces bank riskiness.

The final chapter summarizes our findings and discusses the policy implications of our five main conclusions. These conclusions are: (i) financial liberalization reduces the likelihood of systemic crises, (ii) an adequate regulatory environment is a pre-requisite for successful financial liberalization, (iii) large banks face lower earnings volatility in the wake of financial crises, (iv) bank growth and profitability dynamics are different in OECD and non-OECD countries, and (v) the presence of a controlling owner in a banking firm can lead to better bank governance.

1.3 Contribution to the Literature

The conclusions drawn from this thesis are important for both financial sector research and policy-making bodies. As we discussed before, a proper appraisal of various risk factors is the fundamental and foremost part of the risk management of the banking industries all over the world. A number of studies[2] report that financial liberalization increases the likelihood of banking crises, however, the data used by these studies is

[2] See, e.g., Demirgüç-Kunt and Detragiache (1998, 2000) and Mehrez and Kaufmann (2000).

rather subjective and mostly one-dimensional. In chapter 2 of this thesis, we show how different kinds of financial reform impact the likelihood of systemic and non-systemic crises conditional on supervisory environment and level of liberalization in the financial system. The results drawn emphasize the importance of up-to-date supervisory control to reap the benefits of financial liberalization. Additionally, we show that financial reform actually reduces the likelihood of systemic crises, if a satisfactory supervisory control environment is available.

Although some studies[3] examine the impact of bank size and business cycles on bank profitability and risk-taking separately, on analysis of the variation in the impact of financial crises on bank profitability with changes in bank size and market concentration is missing in the literature. The results reported in chapter 3 of this thesis suggest that larger banks are better able to withstand financial crises. Moreover, we also show that less concentrated financial systems face lower bank earnings volatility in the wake of financial crises.

Growth and earnings volatility of banks has been researched for five OECD countries by Goddard *et al.* (2004a, 2004b). However, an analysis of differences in the dynamics between banks located in OECD and non-OECD countries is currently missing. As we show in chapter 4 of the thesis, the banking structure in OECD and non-OECD countries is quite different in terms of industrial organization, so differences in dynamics of growth and profitability can be very important. Chapter 4 of this thesis shows persistence in banking profitability and emphasizes the difference in the industrial organization of OECD and non-OECD countries using a dataset on banks operating in 65 countries. The results drawn from this chapter show that bank growth and profitability depend on the historical growth and profitability trends, bank size, and market structure.

Also the analysis of the impact of bank ownership structure on the impaired loans ratio and the capital adequacy ratio is largely missing in the literature. A close and recent paper by Laeven and Levine (2008) examines the impact of ownership concentration on the so-called z-score. However, they only consider ownership stakes of 10 and 20

[3] See Bikker and Haaf (2002), Berger *et al.* (2005) and Stever (2007).

percent, whereas we show in chapter 5 of this thesis that a controlling stake (i.e., ownership with 50 percent or more of the shares) has a different impact. We also show the variation in the role of ownership concentration at different levels of shareholders protection rights and supervisory control in addition to using a much larger dataset as compared to existing studies. Chapter 5 of this thesis underlines the importance of ownership monitoring in banking firms. We show that at different levels of supervisory control, this ownership monitoring can be an important control mechanism.